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JUNE 1982



SYNCHRO SETTE

THE SUBSCRIPTION
MAGAZINE



FOR THE ZX-81
MICROCOMPUTER

SYNCHRO -SETTE

THE SUBSCRIPTION MAGAZINE FOR THE ZX-81 MICROCOMPUTER

IN THIS ISSUE

JUNE 1982

This Months Cassette Programs	3
Editor Ramblings	7
The Computer Tutor.....	9
The Incredible Cipher Machine.....	11
The SPECTRUM	14
User's Groups	15

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*** THIS MONTHS CASSETTE PROGRAMS ***



Where is my Synchro-Sette?

Each program is recorded twice.

1K side:

#1 - ALIEN-BASE

A graphic game program where an ALIEN SHIP descends from the sky to build a BASE on earth which when completed will have 7 stars.

The SHIP comes down in corridors from 1 to 5. Each time it descends 1 level, a point is added to its score in the upper right hand corner of the screen. When the SHIP reaches the bottom of the screen and deposits equipment for the BASE, 100 points are added to its score.

You can stop the SHIP by entering the number of the corridor it is presently in. If you enter the wrong number, the program may break and you lose the game (1K only, try it without the RAMPACK).

If you enter the right number, a YOU GOT ME message will be displayed.

NOTICE - ZX-80 owners add line #55 PAUSE 50

#2 - CLOCK

Run this program and enter the correct time in the 24 hour clock mode such as 3:35 in the

afternoon would be 15:35 or 1535.

The screen will then display the time in hours, minutes and seconds. You will notice that when the seconds hit 60, the minutes automatically advance one and when the minutes hit 60, the hours automatically advance one.

The time however, will not advance beyond 12 midnight.

NOTICE - ZX-80 owners add line #140 PAUSE 100.

#3 - MORTGAGE-1

Ever wonder how much money the bank gets from you when you are paying your mortgage according to their rules?

Quite a bit.

For example, let's say that you were buying a house in today's market for \$100,000 and you got a 30 year mortgage at 16% interest.

Your monthly payments for the principal (money to be subtracted from the loan) and for the interest (the money the bank gets to keep) would be \$1344.75 per month.

How much of that payment do you think goes against the principal? Would you believe that during the first year, less than 1% (from 11.42 the first month to 13.29 the 12th month)

is applied against the principal?

And what happens to the other 99 plus percent? That's right, the bank keeps it.

Sounds crazy but it's true. These three figures pretty much represent what an average home goes for these days in the U.S.A..

The bank would get all of their money back in about 6 to 7 years and the rest, less their costs, is gravy.

The majority of the principal however, does not get paid until approximately the last 6 to 7 years of the term.

In other words, the bank gets the majority of their money before inflation has had a chance to devalue its purchasing power.

Fortunately in most states, lending institutions by law cannot penalize the mortgagee for pre-paying the loan, as long as the lending institution is notified that excess in the payments are to be applied against the unpaid principal and NOT TO BE HELD IN ESCROW for taxes or insurance.

In this program, it will ask PRINCIPAL. That is the amount of the loan such as \$100,000 in the example.

It will then ask PERIODS. This is the amount of months left in the loan. For 30 years, you would enter 360. 29 years would be 348, etc.

It will then ask for INT. RATE. That would be the interest rate such as 16 (not .16).

If the principal is \$100,000 or over, change the last TAB in line #210 from 26 to 25.

If the interest rate is over 15%, change line #190 to LET B = INT (100 * (M - A) + .05) / 100

If this program is running on a 1K machine, it will run out of memory after displaying a few lines. Just enter CONT each time this happens.

NOTICE - If you wish, you might

want to change line #215 to INPUT Z\$ especially for ZX-80 machines. This way, you can press the enter key when you are finished studying the last line of figures.

This program along with the 16K program MORTGAGE-2 can give a person a real insight into not only how lending institutions make a tremendous amount of money from the people they lend money to but also how the mortgagee can turn the tables on them and prepay the loan and save immense amounts of money in the process with only a small pre-payment schedule.

#4 MARQUEE-1

All these 1 and 2 programs this month. Oh well, LOAD this program, but DON'T RUN it. Instead, type in GOTO 20 and then ENTER.

Pretty neat, huh?

After you're sick of looking at the message, you might want to try entering your own.

BREAK the program and RUN it this time. Now start entering your own message (on 1K machines, you are limited to about 50 characters) and then enter.

If you have a message you want to save, just BREAK the program and save it on another cassette. Then whenever you want to show it off to your friends, just LOAD it and ENTER - GOTO 20.

For you 16K owners, wait till you see MARQUEE-2.

If MARQUEE-1 is too hard to read, BREAK the program once it is running and ENTER - CONT.

16K side:

MARQUEE-2

If you liked MARQUEE-1, you ought to love this one. If you would list the program, you

would notice that it is fairly short about 500 bytes. It will not however load into a 1K machine as is. This is because there is an INVISIBLE VARIABLE.

Load the program and again ENTER - GOTO 20. A lot easier on the eyes, this one is.

We plan to use this program or others like it in the cassettes you receive from now on for a BULLETIN BOARD on your screen. It will only work on ZX-81s with at least 16K.

Topics that will be covered will be News, New Products, User Group Info., Advertising (boo), and any other information that we think will be of interest to you.

I have some plans to really dress up this program in the future. I hope you will like it.

If you want to enter your own messages, enter the line #10 INPUT A\$ and use the same format as outlined for the MARQUEE-1 program for saving messages.

NOTICE - ZX-80 users add line #90 PAUSE 75.

#2 - CIPHER

The INCREDIBLE CIPHER MACHINE. I intend for us to have a lot of fun with this one now and in the future. This program is the topic of an article in this issue.

Basically what it does is converts a message you have entered into a code of numbers.

A keyword is used to scramble the numbers so that they cannot be deciphered by looking for duplicates.

To decipher a coded message which is a list of numbers, enter the numbers and then the keyword. If you have entered the wrong keyword, the message IS THIS RIGHT will appear on the screen. If you haven't used the correct keyword, the program will allow you to try again without having to enter the complete code list again.

#3 - SCRAMBLED WORDS

If you read the article in the APRIL/82 issue about the READ, DATA and RESTORE techniques, they are used in this program to create a list of 200 five letter words.

This program is an educational game for two players. Each player will have ten words, each picked at random. Each time a word is picked, it will be scrambled and displayed on the upper portion of the screen. A black box will appear in the center of the screen and a 60 second timer will appear in the upper right portion of the screen and start counting down.

Enter the letters, one at a time. Press the key firmly and hold it until the letter appears in the black box and then let go. If you hold it too long, the letter will duplicate.

YOU CANNOT BACKSPACE. If you make a mistake, finish the word and the computer will allow you to try again.

If you find any repetition of words, particularly when just starting the game from the last time you played, enter the line #203 RAND.

If you do not believe there are 200 words in the DATA line, BREAK the program after the first word appears on the screen and ENTER this statement: PRINT LEN A\$.

If that doesn't convince you, ENTER this statement: PRINT A\$. That only shows you the first 704 characters of the string variable because that's all the screen will hold. Now ENTER this statement: PRINT A\$ (705 TO LEN A\$).

This program would probably hold over 2000 five letter words in your machine if someone wanted to type them in.

NOTICE - unfortunately, this program does not run properly on the ZX-80 machines as is. I have tried various methods to make it usable on that machine but it

seems too many input errors can occur for the user. The problem lies with trying to use the INKEY\$ function at the same time the 60 second timer is operating.

If anyone can come up with a solution, I know our 16K ZX-80 subscribers would appreciate it and we would be happy to print it.

#4 - MORTGAGE-2

This program was originally entitled, HOW TO SAVE MONEY ON YOUR MORTGAGE BUT NEVER KNEW HOW OR REALLY DIDN'T CARE but I was afraid that those who wanted to recall it from tape by the title, might get mad at me.

As explained in the reference to the 1K program, MORTGAGE-1, lending institutions stand to make a lot of money if you play by their rules.

You don't have to as most states make it illegal for a lending institution to penalize the mortgagor who wants to pre-pay the loan.

What this means to the mortgagor is that if he or she wants to put extra money against the principal, the lending institution cannot charge him or her any money for doing so.

You are probably wondering if pre-payment can make that much of a difference. I assure you it can particularly in this day of double-digit interest rates and 25 to 30 year maturities.

I have asked people how much they thought their mortgage maturity would be shortened, that is how many less years would they have to pay if they increased their payments by 5% or 10%.

Most people said they thought with a 30 year mortgage and a 15% to 17% interest rate, they would save 2 or 3 years.

I then asked them how much money would they think that they would save with a 5% to 10% increase.

I was usually told at the most a 10% to 20% savings off

the total amount.

Well, get ready to be surprised if this is what you believed. A 5% increase in monthly payments of a mortgage of \$75,000 with a 29 year maturity, will save the owner over 10 years of payments and over \$100,000.

That's right - instead of having a 29 year mortgage, it is now paid off in less than 19 years and the money saved is more than the original loan.

What would that loan cost you if you paid it off the way the bank wanted you to pay it? Run the program and find out.

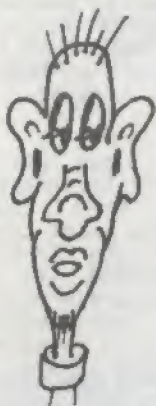
The program starts by asking you for the amount owed, the years till maturity and the interest rate.

Someone might want to convert this program to ask for the amount of months till maturity and then show the listing by the month rather than by the year.

The program then displays 5 columns. The first is the amount of years needed to pay off the mortgage at the payment rate as shown in the second column. The third column shows the EFFECTIVE INTEREST RATE. This is not the true mortgage interest rate as if you were to RUN the program using this interest rate and maturity period and would expect to see the same figures from that point on. Rather it is calculated to be the rate that would occur from the proportions of the original loan against the total that would be paid using the corresponding monthly payments and balancing that against the original interest rate.

Although not the same, it should be close and is actually a more practical rate in terms of visualizing how pre-payment can also lower the interest rate.

The fourth column shows the extra amount per month needed to achieve this goal and the last column shows how much money would be saved if the



* EDITOR RAMBLINGS *

CES SHOW IN CHICAGO

Please excuse the delay of this month's issue. I wanted to include information from the Consumer's Electronic Show in Chicago held at McCormick Place from June 6th to June 9th.

It covered three floors and had thousands of exhibits. There were not only computers but the latest technology in telephones, TVs, stereos, TV earth stations, security equipment, etc.

The most popular exhibits were the video recording equipment and tapes and the most crowded area there were the booths dealing with the blue movies.

But that's a whole other area that I'm sure none of you are interested in so let's get to the business at hand.

Sinclair Research had a small booth and was displaying the ZX-81 along with their software. As you probably know by now, Sinclair has dropped their prices. The 1K ZX-81 is now selling for 99.95. The 16K RAMpack is now selling for 49.95 and the ZX-81 kit is now selling for 79.95. Sinclair is only planning to sell these items through mail order until late

summer except for the kit which they plan to sell for a longer period of time.

By that time, TIMEX, who has taken over U.S.A. distribution will have already established themselves in their outlets and will be selling the T/S 1000 computers, available peripherals and software across the counter.

I had the pleasure of meeting Mr. Clive Sinclair and asked him the question a lot of people have asked me and that is why the printer is still not available here in the U.S.

It seems that the U.S. Government Agency, the F.C.C. has not yet approved the device for sales in our country. The printers are for the most part available and are just waiting for this approval.

The SPECTRUM was on display but not hooked up to a monitor and running. It is a beautiful machine, and true to the tradition of past performance, it is a very compact unit. The dimensions are 233 mm wide by 144 mm deep by 30 mm high. This makes it about 50% wider than the ZX-81 with approximately the same dimensions otherwise.

No literature was available on the unit at the show but Mr. L. W. Tyler of Cheltenham England was kind enough to send some to me.

The unit will be available in 16K and 48K versions. The color graphics are spectacular, especially the fine line resolution that allows curves to appear on the CRT that are the equal of the best available competitive color micros. The screen holds 32 characters across by 22 lines with much the

same double screen format as the ZX-81. Running programs however can fill the whole screen.

The BASIC language is almost identical to that of the ZX-81 with some added features for the color and data storage capabilities.

The ability to produce sounds through an external amplifier over a ten octave range with a total of 130 separate tones called SEMI-TONES can be controlled by the BEEP command.

Eight colors - black, blue, red, magenta, green, cyan, yellow and white may be present on the screen at once, with some areas flashing while others are steady. Brightness of the colors can be controlled and a screen border can be produced by the BORDER command.

The keyboard has 40 push button keys with as many as 6 functions per key. These buttons push against a membrane keypad which is inside the computer enclosure.

The SPECTRUM runs at the speed of the ZX-81 in the FAST mode with the steady display of the SLOW mode. It does not have either of these commands because it does not need them.

The Micro-Drive is a marvel. It measures approximately 3" by 3" by 2" and will hold 100K of programs per disk. You can actually put it in your hand and wrap your fingers around it. Up to eight of these drives can be connected to the SPECTRUM.

The transfer rate from disk to computer is 16K bytes per second with an average access time of 3 to 5 seconds. The rumored price is 99.95 per unit and it appears that they connect directly to the computer without an interface.

For those who wish to stay

with the cassette tape storage method, the SPECTRUM has a high speed LOAD & SAVE - 16K in 100 seconds with VERIFY & MERGE for programs and separate data files.

Two manuals come with the computer, one for beginners and the other for advanced programmers. The same printer that works on the ZX-81 will work on the SPECTRUM. The paper rolls by the way are 4" wide and 65 feet long and will be available in 5 pack packages. No price is available at this time. Printing speed is 50 characters per second with 32 characters per line and 9 lines per inch.

Mr. Tyler informs me in a letter that some of the add on items for the ZX-81 from supporting companies exhibited at a recent computer fair in England included a Stringy-Floppy recorder with extremely fast access time and a Disk Drive that will sell for around \$340.

His own machine includes a 4K graphic ROM, a full sized keyboard, numeric pad and a printer, and he plans to add a TOOL-KIT EPROM and possibly the Stringy-Floppy or Disk Drive.

He has already ordered the SPECTRUM as it has been for sale since mid-April. Lucky devil to have all those things available while most of us here still can't figure out how to get a printer.

On the other side of the coin, TIMEX had their booth on the floor below Sinclair's and were showing off their new T/S 1000 computer with the 16K RAMpack.

I had a lengthy discussion with the people in charge of software development and marketing research. For those of you that were contemplating purchasing one of these machines

(continued on page 13)

the Computer Tutor



=====

CONVERTING STRING VARIABLES TO NUMERIC VARIABLES AND BACK AGAIN

=====

This month's lesson involves searching for a solution to a shortcoming of the ZX-81 computer. The ZX-81 only allows 26 string variables from the letters A\$ to Z\$.

What does the man in the back row ask? What is a string variable?

Shame, shame, chapter 7, page 32 in the owner's manual. I will review this chapter with you.

There are two types of variables, string and numeric. A numeric variable allows the student to assign a numeric or mathematical value to a letter or group of letters.

If you can understand the concept that if $(A = 5)$ and $(B = 6)$, then $(A + B = 11)$, then you pretty much have a grasp of what numeric variables are all about.

String variables are a little bit different. The letters always have a dollar sign following them and the mathematical arithmetic process achieves something different. If we were to enter the following program into the computer, instead of 11 being the result of the addition of the two numbers, we would get 56.

```
5 PRINT "ENTER THE FIRST  
NUMBER"
```

```
10 INPUT A$ (enter 5 when  
RUN)  
15 PRINT "ENTER THE SECOND  
NUMBER"  
20 INPUT B$ (enter 6 when  
RUN)  
25 PRINT "THE TOTAL OF THE  
TWO NUMBERS IS "  
30 PRINT A$ + B$
```

Now edit the program so that all the dollar signs are removed (good practice) and run it again with the same figures entered.

See what I mean? Put the dollar signs back in (good practice) and RUN the program again but this time instead of entering (5) and (6), enter (HELLO) and (JOHN).

Now we see on the screen - HELLOJOHN. To get the proper separation between the two names, change line 30 to read -

```
30 PRINT A$ + " " + B$
```

You see, when you add string variables together, they are tacked onto each other. Numeric variables can be added to, subtracted from, multiplied and divided. String variables can only be added to each other.

String variables are what we use to assign names, addresses, Zip codes, telephone numbers and any other character information we deem pertinent.

But we only have 26 of them. Does anyone see the problem we will encounter? Yes, that man in the back row again.

That's right, we are going to run out of them pretty quick. Let us say that we wanted to create a directory of all our acquaintances and list the name and address information with a program written in BASIC that would allow us to enter this information.

What's that you say? In the NAMESORT program on the APRIL/82 cassette, a method was used where only one string variable was dimensionalized to allow the input of 10 names?

Very observant. I didn't know that anyone was doing anything with the programs except running them. You are right of course and in theory, this would accomplish our goal for the most part.

There is one flaw in the theory however. This method uses up an enormous amount of memory compared to methods used in other BASICs but it does work.

Is there another way? I don't see any hands. Oh well, the answer is yes, but only for limited applications.

Your poor old professor has come up with a way to enter as many character entries as the computer's memory will allow, but each entry can only be a maximum of four characters long.

Please, please, no boos or catcalls - it is most unbecoming. I did say for limited applications, didn't I?

Enter the following program - 16K computers only:

```
10 DIM A(100)
100 FOR N = 1 TO 100
105 SCROLL
110 PRINT "ENTER NAME
    (4 CHAR. MAX.)
120 INPUT A$
122 PRINT A$
```

```
123 IF A$ = "" THEN GOTO 1000
125 LET A(N) = 0
130 FOR I = 1 TO LEN A$
140 LET A(N) = A(N) * 100 +
    CODE A$(I)
150 NEXT I
160 NEXT N
1000 LET R1 = N - 1
1005 CLS
1010 FOR N = 1 TO R1
1013 SCROLL
1015 PRINT A(N),
1020 LET A$ = STR$ A(N)
1030 FOR I = 1 TO LEN A$ STEP 2
1040 PRINT CHR$(VAL A$(I TO
    I + 1)))
1050 NEXT I
1060 PRINT
1070 NEXT N
```

Now, RUN this program and enter names or numbers for each prompt. You are allowed up to 100 entries but if you want less, just press ENTER and the program will automatically break out and start converting your entries first into CODE numbers, 2 for each inputted character, and then will convert the CODE numbers back into the characters.

Ah hah, I see that guy in the back just can't follow directions. He inputted more than 4 characters for some of his entries.

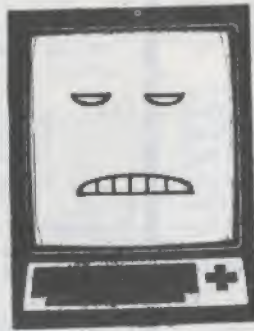
OK, you others can try it too. Boy, why is there so much lack of respect for teachers these days. Rodney Dangerfield isn't the only one.

Now you have the gall to ask me why the computer does not give the correct characters after the first four?

Well I'll tell you why. The computer only has the capability to give accuracy to the eight digit. This program assigns 2 digits to each character. Eight divided by two is how much? The gentleman in the rear has his hand up again.

That's right, four - and that is why there is only the first four characters that are correct.

(continued on page 12)



* THE INCREDIBLE CIPHER MACHINE *

During World War Two, the countries involved spent much time developing techniques to create messages that could be deciphered by their own agents in battle but could not be easily deciphered by the enemy.

These countries also spent considerable time trying to decipher the messages of the enemy. The best known cipher machines were those used by the Germans called ULTRA and the Japanese code machines.

The United States and Britain were successful in cracking these codes and the machine used to crack the German code was called ENIGMA.

These were not computers as we know them today, rather typewriter devices that could transpose numbers, letters or other characters to take the place of the coded characters.

This month's program, CIPHER, can be used to create and decode messages by substituting two numbers for every character of the message. Although probably not as sophisticated as the machines used during the war, the speed of operation is certain to exceed that of those earlier machines.

You probably remember a method in your earlier school years where a number was used to substitute for a letter of the alphabet such as <A> being <01>, being <02> and so on. Perhaps you saw another method where each letter of the message was advanced one or more letters such as <A> being , <F> being <G> and so on.

These methods could easily be deciphered by anyone with a pencil and paper and enough time on their hands to go through all the possibilities.

CIPHER uses the ZX-81 codes for each character and adds to them the codes of the characters of a keyword. Here is how it works:

The ZX-81 codes for the numbers and alphabet are listed on pages #137 to #138. The numbers from 0 to 9 are codes 28 to 37 and the letters A thru Z are codes 38 thru 63.

A message is inputted into the computer and the codes are identified for each character. A keyword is then entered and the codes of each character are also identified. The code number of the first character of the message is added to the code number of the first character of

the keyword and this two digit number represents characters one and two of the coded message.

The code number of the second character of the message is then added to the code number of the second character of the keyword and this two digit number represents characters three and four of the coded message.

This process continues until the last keyword's character is used and then the keyword code number shifts back to the first keyword character. This constant looping continues until the last character of the message has been coded.

The only exception is when the program encounters a null space between words, the code will be a double 0.

To decipher a message the process is reversed. The coded message of numbers is entered along with the keyword. The computer will then print on the screen the deciphered message and ask you if it is correct. If you see a message that makes sense, you know you were successful. If all you see is gobbledgeesook, the computer will allow you to enter another keyword without re-entering the message. This can be done over and over until a successful decipher has been achieved.

As you can probably see, this makes it much more difficult to decipher a message.

Try this sample. Enter <2> for the beginning prompt. Now enter the following message:

456068556561596064004359557400
5856504900675164754445527332

Now enter the keyword. I'm not going to tell you what it is but I'll give you a clue. The keyword is the last name of the last world chess champion to come from the U.S.A.

Here are some more - Decipher them to learn some interesting facts. Keywords will be given in next month's issue:

#2 - 556655007071540058605750
715559005559405400556260
587000424446006849574958
6664008045465568

Keyword clue - Gift you would give a married couple on their 75th wedding anniversary.

#3 - 424268594151594269004242
463864006355485759514700
435264005758486165674500
624559494500485100535846
585264

Keyword clue - Country of the world with the second largest land area.

#4 - 480066636266750062510048
656082640054780058467157
5249004600580062515077

Keyword clue - A nearly extinct bird that cannot fly.

We plan to give you a few of these with each issue. We might even run a contest using this program to create messages each month that would be collected for a final answer.

If you have any interesting messages you would like to submit with keyword clues, send them to me for evaluation. Send the keyword along with it so it can be checked and try to keep the messages under 4 lines.

COMPUTER TUTOR (cont.)

Ok, for your homework, I want you to rewrite this program so that it will allow at least eight characters inputted and allow them to be converted.

What was that noise? The man in the rear passed out and fell off his chair. Will someone please get the smelling salts?

EDITOR RAMBLINGS (cont.)

and were wondering whether the ZX-81 software was compatible with the T/S 1000, I have been assured that it is. The two computers (except for the extra 1K of RAM in the T/S 1000) are identical. The question I rose in the last issue about the difference in baud rates was discussed and I was assured that both machines operate at 300 baud through the cassette ports.

will be on time).

A TIMEX representative assured me that a much greater quality control effort will be maintained in the production of future TIMEX computer equipment.

I asked if the SPECTRUM will follow the marketing format of the ZX-81 and be sold through mail-order ads for about a year and then be sold by TIMEX through their U.S.A. outlets across the counter.

The representative told me that this was not what was planned and that TIMEX would probably be selling them immediately through their outlets and that we should start seeing them around October of this year. This introduction date was also confirmed to me by a representative from Sinclair.

We then showed off our software to each other and I must say, I was very much impressed with a demonstration program I was shown on the T/S 1000. A fast moving graphics display with a beautiful depiction of the space shuttle Columbia, was as good as any I had ever seen on any other computer with comparable pixel resolution.

To close, I'll say that Mr. Sinclair has been invited to the Chicago User's Group meeting on the 20th of this month and I hope to have some interesting things to tell you in next month's issue (which hopefully will be on time).

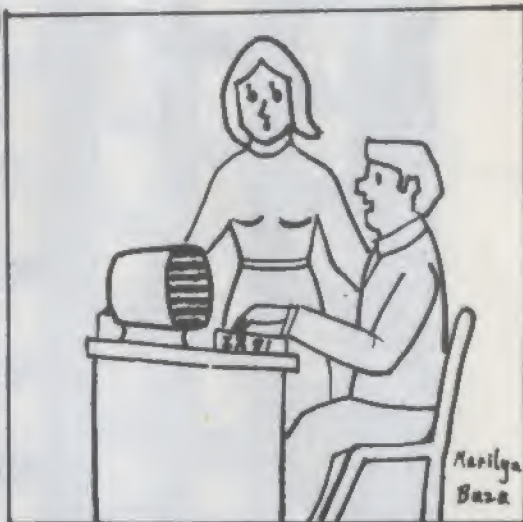
CASSETTE PROGRAMS (cont.)

corresponding extra amount from the fourth column were applied.

If anyone is in this situation, they might agree that their SYNCHRO-SETTE subscription was a good investment.

To make the program a little easier to see while it is running, change line #595 from PAUSE 100 to INPUT Z\$.

In the August cassette issue, we will start seeing some programs on cassette from some of our readers.



This Synchro-Sette Personal Finance Program is terrific. Now we know exactly when to file for bankruptcy!

 * USER'S GROUPS *

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